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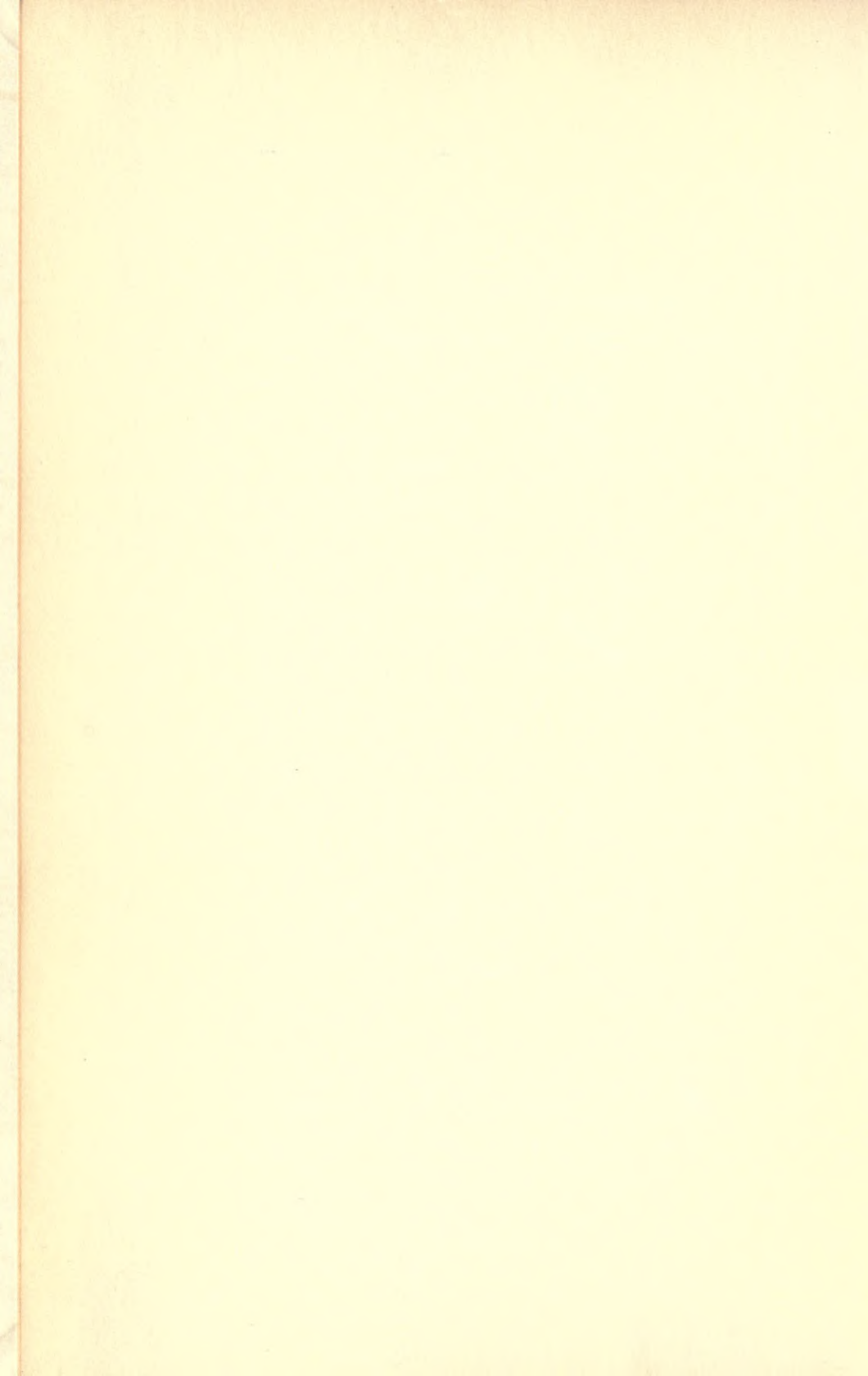
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THE ANNELLATED CORAL SNAKE

Micrurus annellatus Peters

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What is perhaps the most conspicuous error in my preliminary account of the coral snakes of South America in 1936 is the confusion of *Micrurus annellatus* Peters with the black-capped species *langs-dorffi* and the related forms. When the Bassler collection from Peru in the American Museum of Natural History was made available to me it became immediately evident that *annellatus*, with a light band crossing the parietals, is a fully distinct species, not especially related to the black-headed forms. *Elaps annellatus* had been reported only twice after its original description, and I had seen only the type and the two specimens in the British Museum. In 1936 I was much intrigued by the discovery that the alternately narrower and wider black rings in those species that are apparently without red in their coloration actually represent tricolor species with simple annulation in which the red zones are invaded by black pigment, and that the initial and succeeding stages in this process are to be seen in various species, from our own *Micrurus fulvius* to its extreme in *M. psyches*. It is more evident to me now than at that time that this trend is a general one in the genus and that a phyletic relationship is not necessarily indicated by it.

Micrurus annellatus, of which museum specimens are typically black and white, is sharply distinguished from the several black-capped species in South America by the presence of a narrow light band (white in preserved specimens) across the parietals. It is now evident that this character is in itself a sharply diagnostic one, with no transitional forms known among the coral snakes with annuli not in triads. It was thus unfortunate that I should have lumped it with the other bicolor species, and it is herewith reinstated as one of the fully distinct South American species of *Micrurus*.

The conversion of a red, black, and yellow snake into a black and yellow one reaches its full extreme in adult specimens of *Micrurus*

annellatus in the northern part of its range, in northeastern Peru. A juvenile specimen, however, has the red zones entirely distinct, and the otherwise closely related form in southern Peru and adjacent Bolivia tends to preserve this original and juvenal coloration into the adult stage.

The Museum is fortunate in having obtained specimens from the Amazonian versant of the Peruvian provinces of Puno and Cuzco through the active collecting in recent years of Colin Campbell Sanborn, Celestino Kalinowski, and Mrs. Hilda Hempel Heller. With the greatly enlarged series of typical *annellatus* for comparison, the distinctness of the southern series is evident, and it is described below.

MATERIAL EXAMINED

PERU: Loreto: Sarayacu, British Museum 1931-5-13-59; Cueva Blanca, 1876-7-4-20; Iquitos, AMNH 52586; Pampa Hermosa, Río Caxabatay, AMNH 55451, 53555, 55977; mountain front above Pisqui Plain, AMNH 52895; upper Ucayali, AMNH 71141; Cashiboya, AMNH 52701; Cerro de Contaya, AMNH 53373, 53375; Alto Pisqui, 4,000 feet, AMNH 52311; Monte Alegre, Pachitea, AMNH 53036; Peru-Brazil frontier, Tapiche-Utoquinia, AMNH 52066, 52068. Junín: Chanchamayo, BM 1908-5-29-39 and 40, CNHM 40635; La Merced, Munich, no number. Huánuco: Pozuzo, Berlin 7185 (type). Madre de Dios: Univ. Arequipa no. 59. Puno: Sta. Domingo Mine, AMNH 2957, CNHM 40221, 40222; Sandia, UMMZ 81164; Carabaya, Oroya, BM 1903-6-30-5 and 1907-5-7-7. Southern Peru, CNHM 40199. Cuzco: Marcapata Valley, BM 1902-5-29-191; Marcapata Valley, Hacienda Cadena, AMNH 62942.

BOLIVIA: Prov. Beni, AMNH 2975-2976.

The only additional locality known is Cononaco, above Iquitos on the Curaray River, reported by Peracca.

Micrurus annellatus Peters

Elaps annellatus Peters, 1871, Monatsber. Akad. Wiss. Berlin, 1871: 402—Pozuzo, Peru; Boulenger, 1896, Cat. Snakes Brit. Mus., 3: 418; Peracca, 1897, Bol. Mus. Torino, 12, no. 284, p. 7.

General account of the species.—*Micrurus annellatus* is one of the smaller species of the genus, the maximum length known being 728 mm., a female specimen from southern Peru. The largest specimen from northern Peru measures 717 mm. The most distinctive characteristic is the narrow white (or yellow?) transverse marking over the middle of the parietals. This widens on the side of the head to include most of the fifth and sixth upper and fourth and fifth lower labials, and is then narrowed across the anterior end of the posterior chin-shields. On the parietals the crossband may be narrowly interrupted on the mid-line; in the typical subspecies it is usually narrower than in the specimens from the Beni drainage, about one

fourth or one fifth the length of the parietal in the northern form, a third to half its length in the southern. In AMNH 53375 this ring is widened beneath to cover most of both pairs of chin-shields.

In the adult coloration of the typical form the ancestrally red rings are completely transformed into black ones, their identity shown by their being wider, so that there are pairs of narrow light rings with alternately narrower black rings (2-3 ventrals) and wider ones (4-5 ventrals). There are occasional traces of red on the ventrals in the originally red rings even in very dark specimens. The smallest specimen known, AMNH no. 52586, from Iquitos, body length 239 mm., has the alternate rings plainly red.

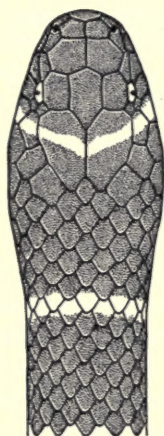


FIG. 62. Head of *Micrurus annellatus annellatus*, AMNH no. 53373, to show distinctive pattern. Natural size.

There is strong sex dimorphism in both ventrals and caudals. Ventrals number from 193 to 205 in thirteen males, from 208 to 225 in eighteen females. The caudals in thirteen males range from 40 to 48; in sixteen females they number from 26 to 35. The anal is invariably divided. No variation has been found in the upper and lower labials, 7/7; the preoculars and postoculars are normally 1-2. The temporals are normally 1-1; a few specimens have temporals 1-2 on one side, none being symmetrical in this respect. Five specimens out of thirty-one have from 1 to 4 entire subcaudals. There is no trace of supra-anal tubercles or keels in adult males.

The total number of major rings (black and red) varies from 37 to 83, from 37 to 51 in males, from 43 to 83 in females. The black rings on the tail exhibit no alternation in width and number from 7 to 9 in males, from 5 to 8 in females.

A series of specimens from southern Peru, to which I have added two Bolivian specimens, is distinguished by a wider parietal ring and the usual preservation of the juvenile alternation of red and black rings in the adults. The two forms are distinguished as follows:

- A. A black and yellow coral snake with alternately wider and narrower black rings separated by narrow yellow ones in adults, and with a narrow yellow band across the parietals; juveniles with black, yellow, and red rings.
M. annellatus annellatus Peters
- B. A black, yellow, and red coral snake in which the red zones tend to be much darkened by black pigment; yellow band across parietals wider (a third to one half the length of these shields).....*M. annellatus montanus* subsp. nov.

***Micrurus annellatus montanus* subsp. nov.**

Micrurus langsdorffi Schmidt and Walker, 1943, Field Mus. Nat. Hist., Zool. Ser., 24: 293 (not of Wagler).

Type.—Chicago Natural History Museum no. 40221, adult male, from Camp 4, about 10 km. north of Santo Domingo Mine, Puno, Peru, at about 2,000 meters altitude. Collected November 2, 1941, by Colin Campbell Sanborn.

Diagnosis.—A coral snake with simple alternation of black, yellow, and red rings, the yellow rings narrow, the red rings a little wider than the black, and heavily blackened; a light ring around the head, crossing the parietals as a narrow band, widened on the sides of the head and continued across the posterior chin-shields; ventrals in males 193–205, in females 208–218; caudals in males 40–48, in females 26–35; red plus black annuli 37–51 in males, 43–51 in females.

Description of type.—A coral snake with cylindrical body and relatively short tail, the head a little wider than the body. Head-shields of normal *Micrurus* type; a single preocular and two post-oculars on each side; temporals 1–1 on each side; upper and lower labials 7 on each side; third and fourth upper labials entering the eye; fifth and sixth upper labials highest; dorsal scales in 15 rows throughout; ventrals 195, anal divided, caudals 47, all except terminal one divided.

Head black with a narrow light band across the parietals, the width of the band about half the length of the parietals, narrowest on the mid-line, widening laterally to cover all of the first temporal and half of the second, and most of the fifth and sixth upper labials; still further widened below, to cover the anterior chin-shields and the posterior tips of the first labials; a light projection of this color

extends to the labial border on the mental. The nuchal ring crosses the posterior fourth of the parietals and the posterior third of the second pair of chin-shields.

Twenty-two black rings on the body, the last incomplete below, seven on the tail. These black rings cover $2\frac{1}{2}$ to $3\frac{1}{2}$ ventrals; they are bordered by narrow yellow rings mostly one ventral or less in width beneath and less than the length of a dorsal scale above; red zones intermediate between the black rings $3\frac{1}{2}$ to $5\frac{1}{2}$ ventrals wide, much darkened above and with small black flecks beneath; most of each dorsal scale in the "red" zones is black.

Measurements of type.—Total length 572 mm., tail 88 mm.

Notes on paratypes.—Thirteen specimens, in addition to the type, come from the valleys of tributaries of the Beni River, in the provinces of Cuzco, Puno, and Madre de Dios, Peru, and Beni, Bolivia. One specimen from the northernmost locality for *montanus* in the Marcapata Valley (Cuzco) is almost entirely black and white, like the majority of specimens from northeastern Peru, and the same is true of the single Madre de Dios specimen.

The numerical data for the two subspecies compare as follows:

<i>Micrurus annellatus annellatus</i> (Northeastern Peru)				
Sex	Number of specimens	Ventrals	Caudals	Total black or black plus red rings
♂	7	194–204	41–47	41–61
♀	14	208–225	29–35	49–83

<i>Micrurus annellatus montanus</i> (Southeastern Peru and adjacent Bolivia)				
♂	7	193–205	40–48	37–51
♀	7	208–218	26–35	43–51

There is no significant difference between the scale counts of the two forms in these series. The differences in number of rings, indicated as narrower plus wider black in *a. annellatus* and black plus red in *a. montanus*, are most significant in females.

All of the paratypes of *montanus* have the light band across the parietals distinctly wider than in the typical subspecies.

Habitat and habits.—The only clue to food habits is that remains of the limbless teiid lizard *Ophiognomon* were found in the stomach of no. 62942, from the Hacienda Cadena, Marcapata Valley, collected by Celestino Kalinowski, in May, 1951.

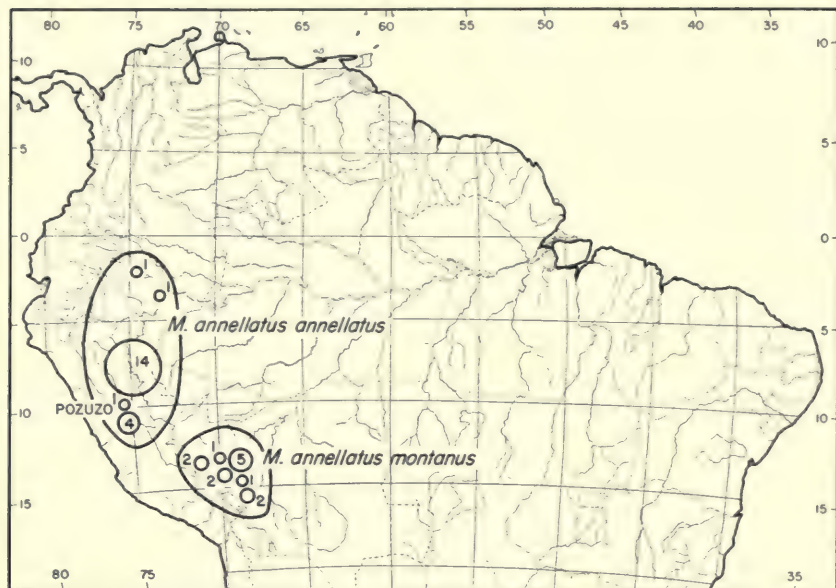


FIG. 63. Distribution of *Micrurus annellatus*. Figures associated with circles indicate number of specimens known.

A specimen measuring 435 mm., from San Ignacio, Sandia, Puno, collected by Hilda Hempel Heller, October 3, 1951, contains five eggs, each about 6 by 16 mm. The largest specimen, from "Southern Peru," collected by Señor Pacifico Oviedo, likewise contains five eggs.

Distribution of species.—The localities reported indicate a somewhat lower altitude range for the northern *annellatus annellatus* than for *montanus*. The type locality, Pozuzo, is at 908 meters, and the majority of known specimens are from affluents of the Ucayali and not from the vicinity of the main stream. Peracca's specimen from Cononaco, and the Bassler specimen from Iquitos are from the Amazonian lowland. Some non-human accidental transport of all kinds of animals from headwater streams to the lowland is to be expected. For *montanus* the known altitudes fall between one and two thousand meters.

In this subspecies the three colors of the majority of coral snakes are represented, so that it is clearly the more primitive.

From the clue that the parietal crossband appears to be a stable phyletic character, it might be reasoned that the closest relative of the Peruvian species is the Central American *affinis* formenkreis; but this is scarcely more than vain speculation.

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